



**Department of
Transportation**

Asphalt Performance Mix Design – NYSDOT Experience



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<http://www.kimley-horn.com/revoked-asphalt-contract/>



Issue Report - 2000

- What are the issues we are trying to address:
 - Permanent Deformation
 - Low-Temperature Cracking
 - Fatigue Cracking
- How are we going to do more with less?

- <https://onlinepubs.trb.org/onlinepubs/shrp/shrp-a-410.pdf>



Issue Report - 2020

- Cracking prevalent, minimal permanent deformation failures and performance; an answer for every question



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Issue Report - 2040

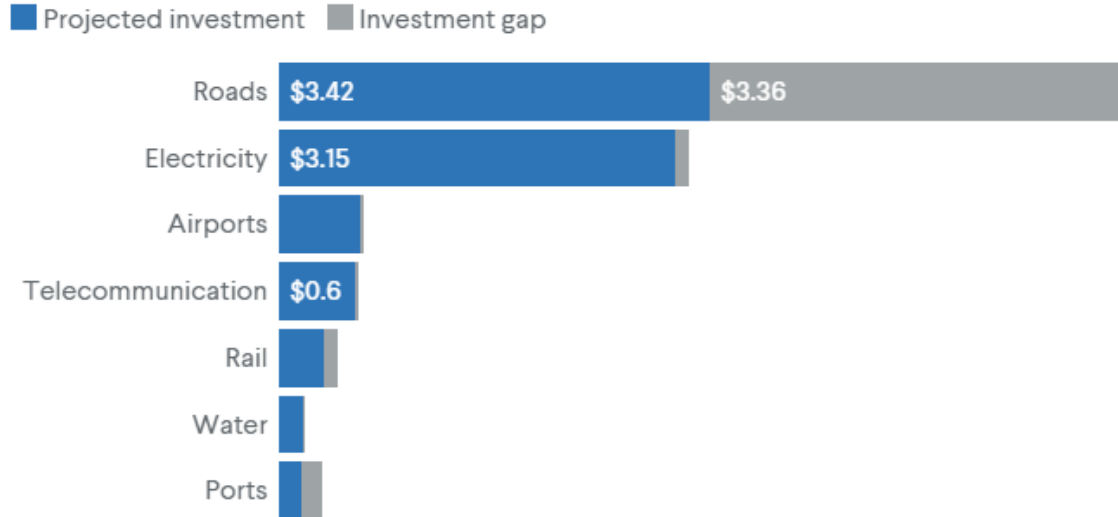
Where are we trying to get to?



Department of Transportation

U.S. Infrastructure Investment Gaps by 2040

Projected public and private infrastructure spending by sector, 2016–2040 (trillions of 2015 dollars)

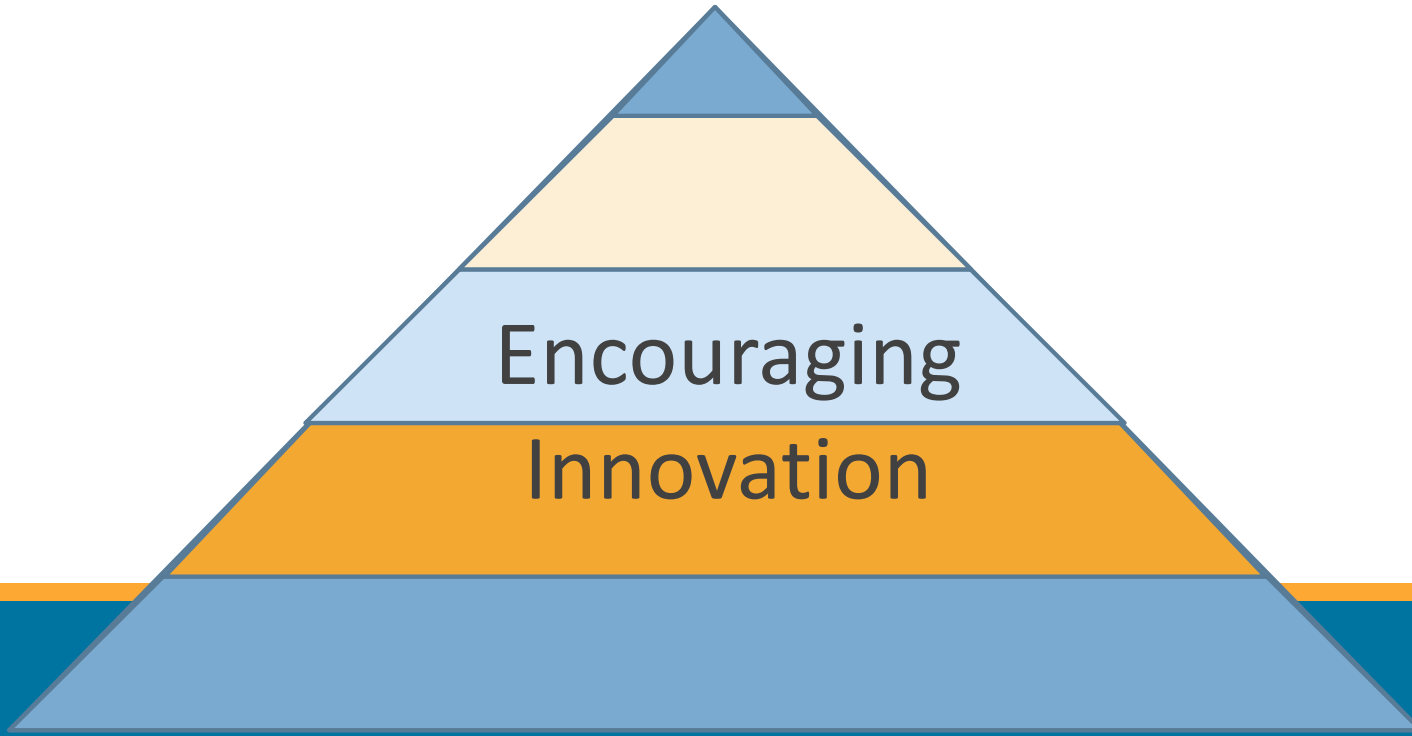


Notes: Investment gap is the difference between projected investment and the investment required to match the best-performing peer countries, accounting for differences in country characteristics. Projected investment assumes the United States continues to invest at current levels and accounts for economic and population growth.

Source: Global Infrastructure Hub.



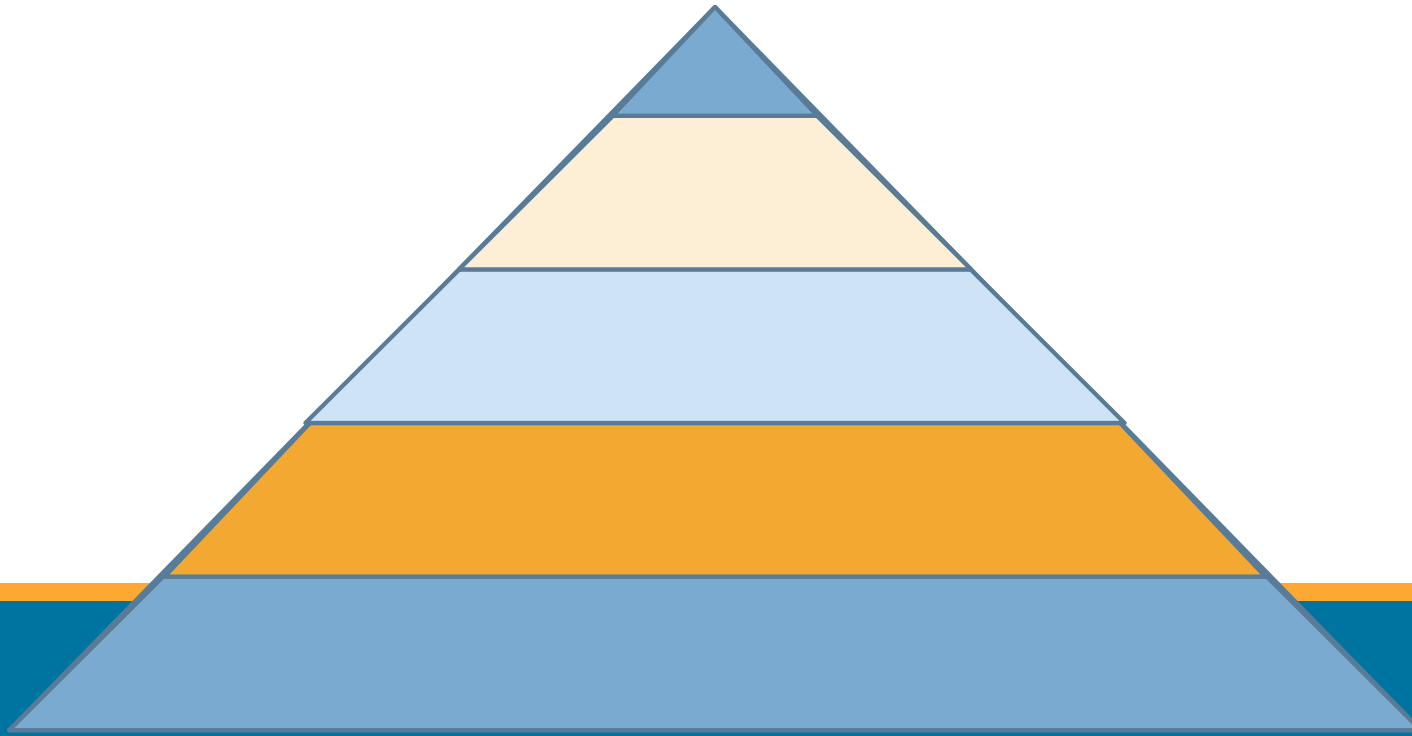
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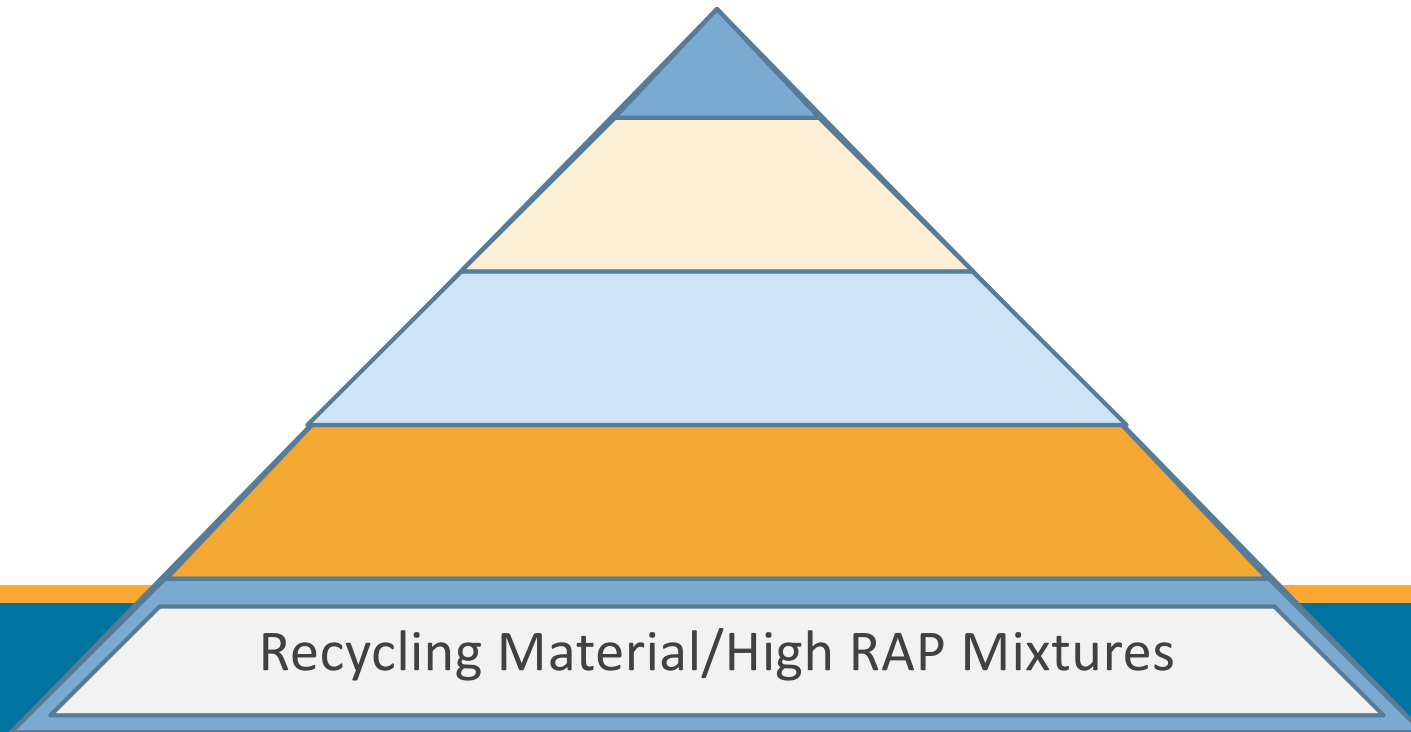
Encouraging Innovation





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Transportation

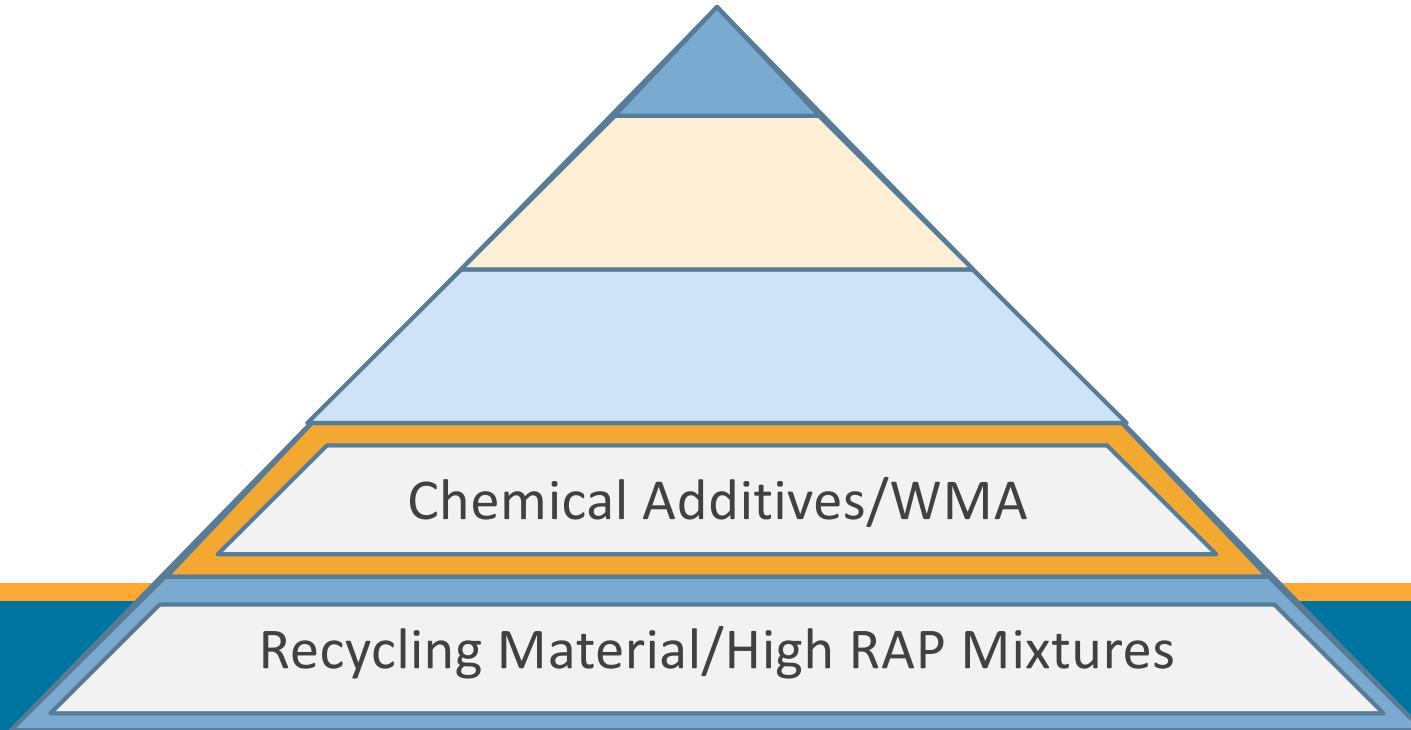
Encouraging Innovation





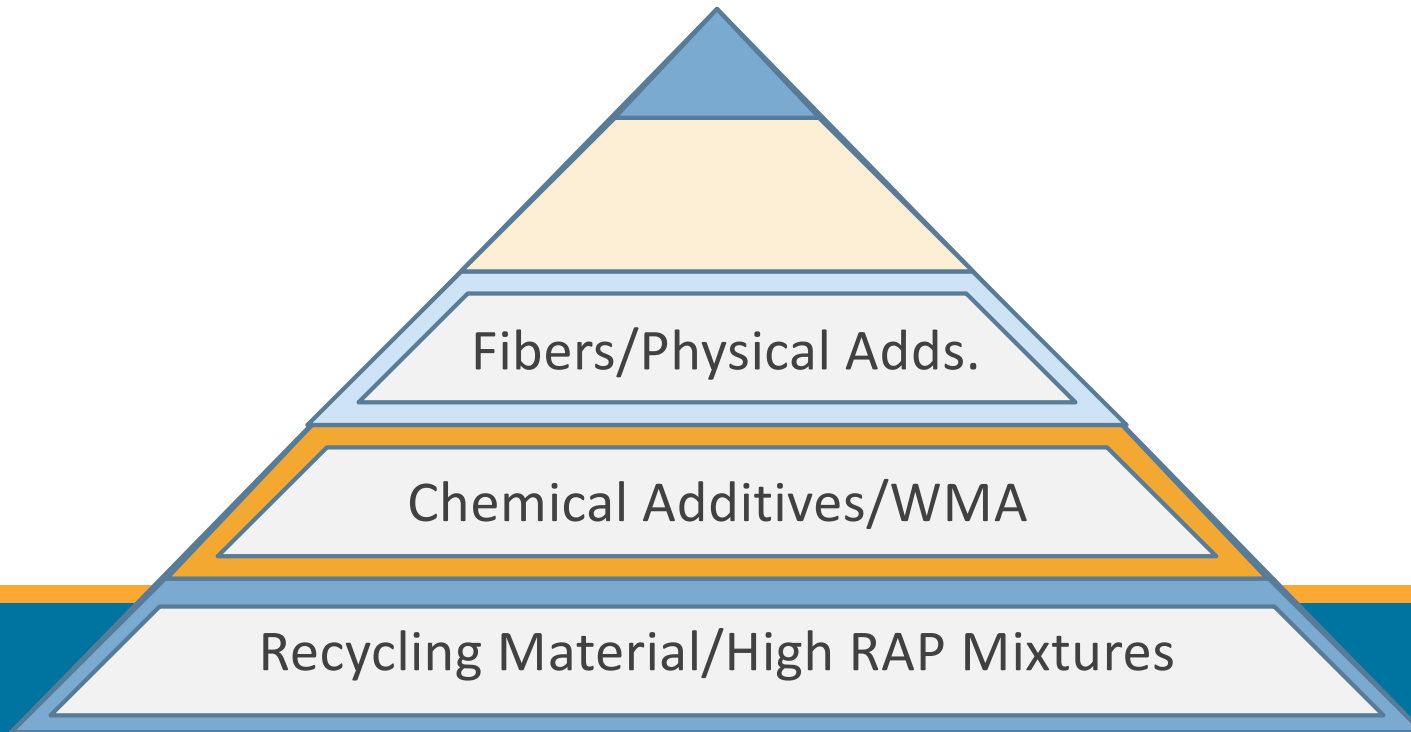
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Encouraging Innovation



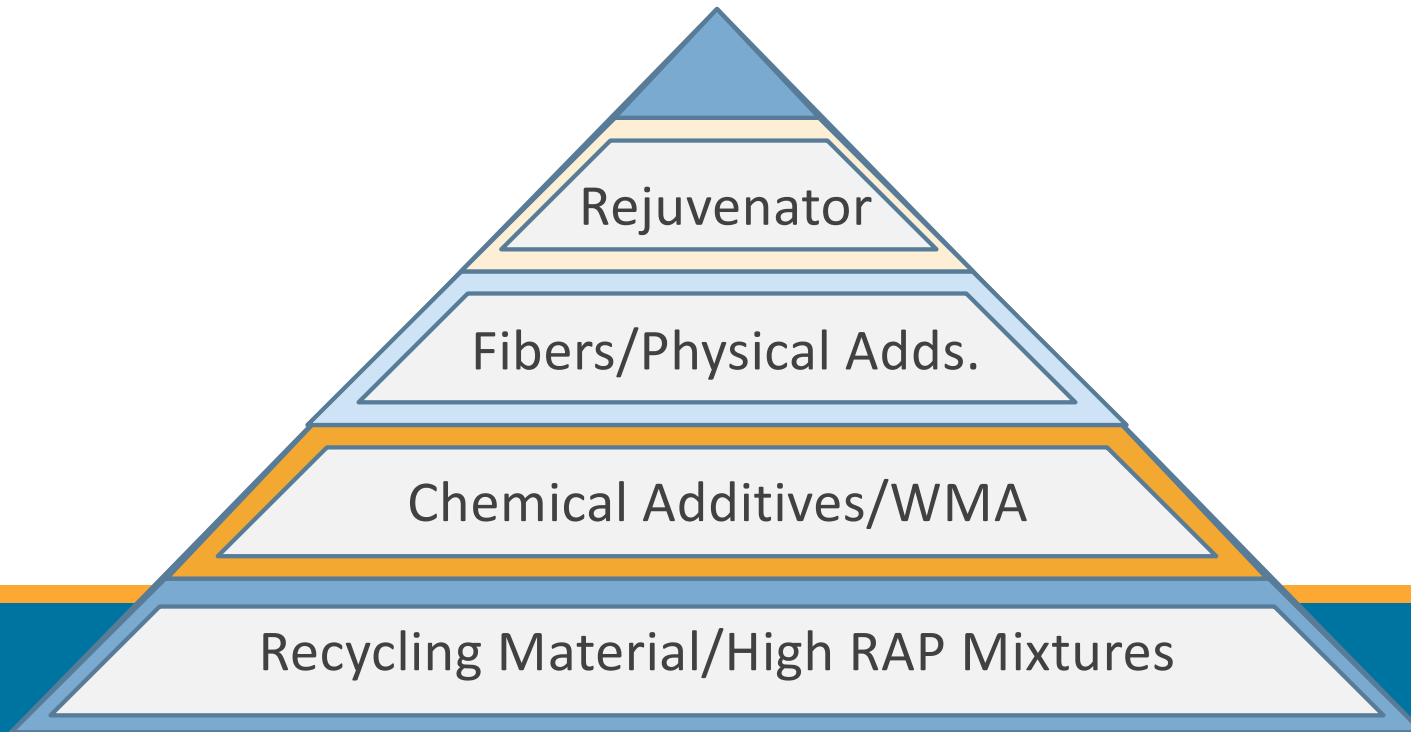


Encouraging Innovation





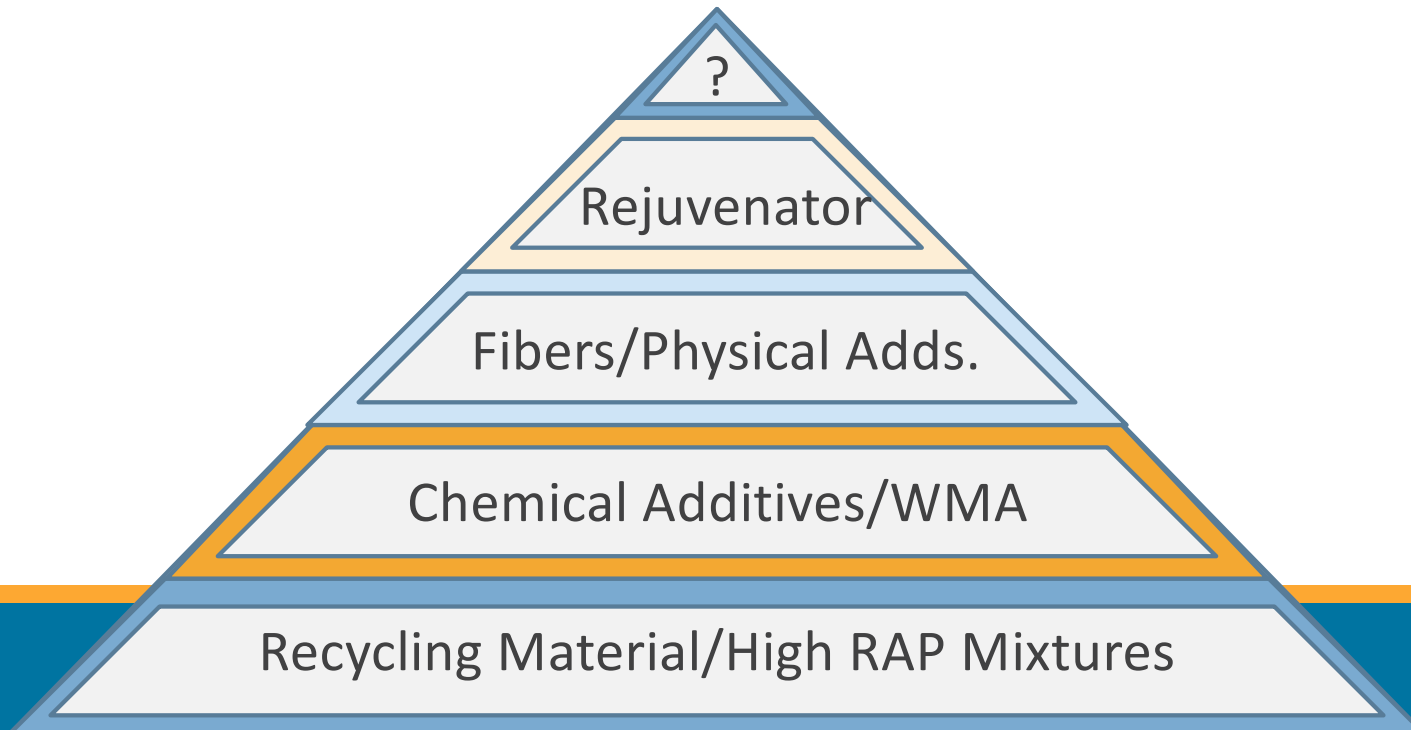
Encouraging Innovation





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Transportation

Encouraging Innovation

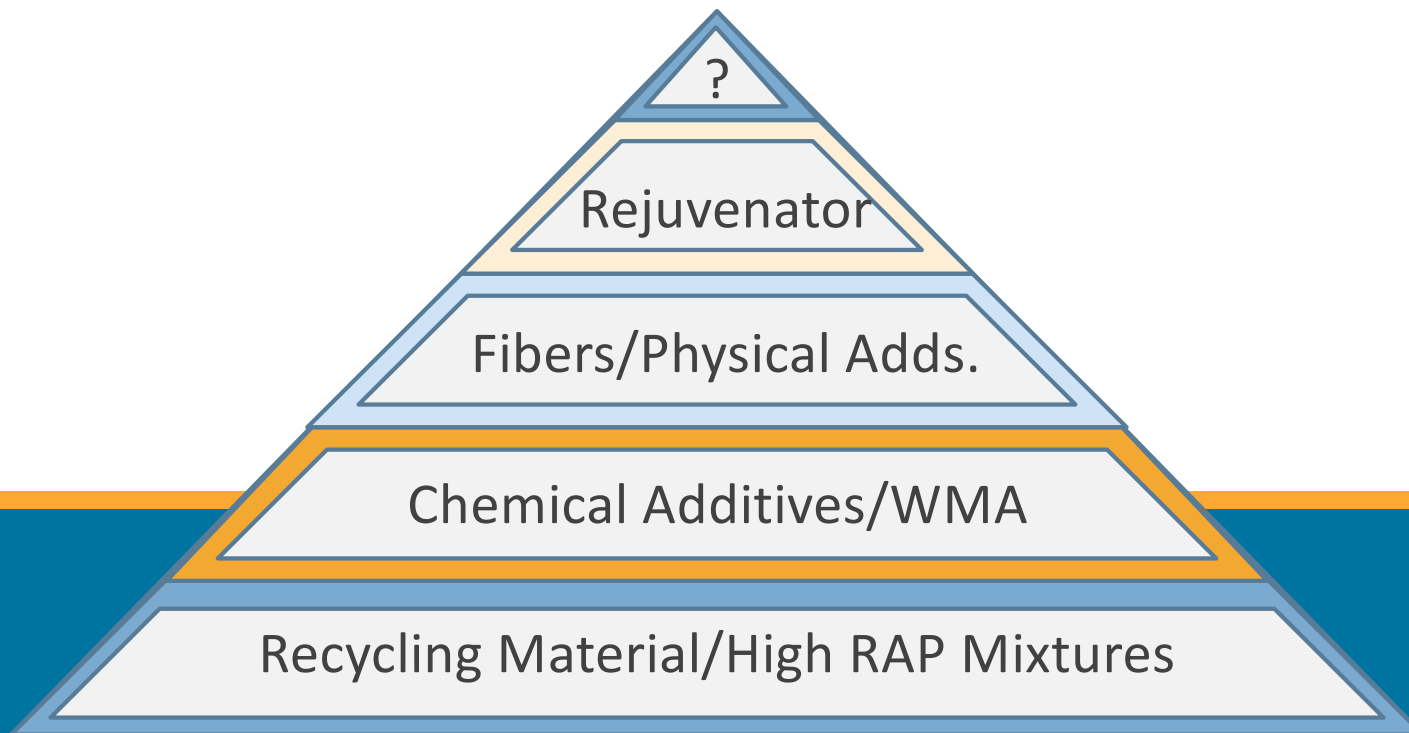




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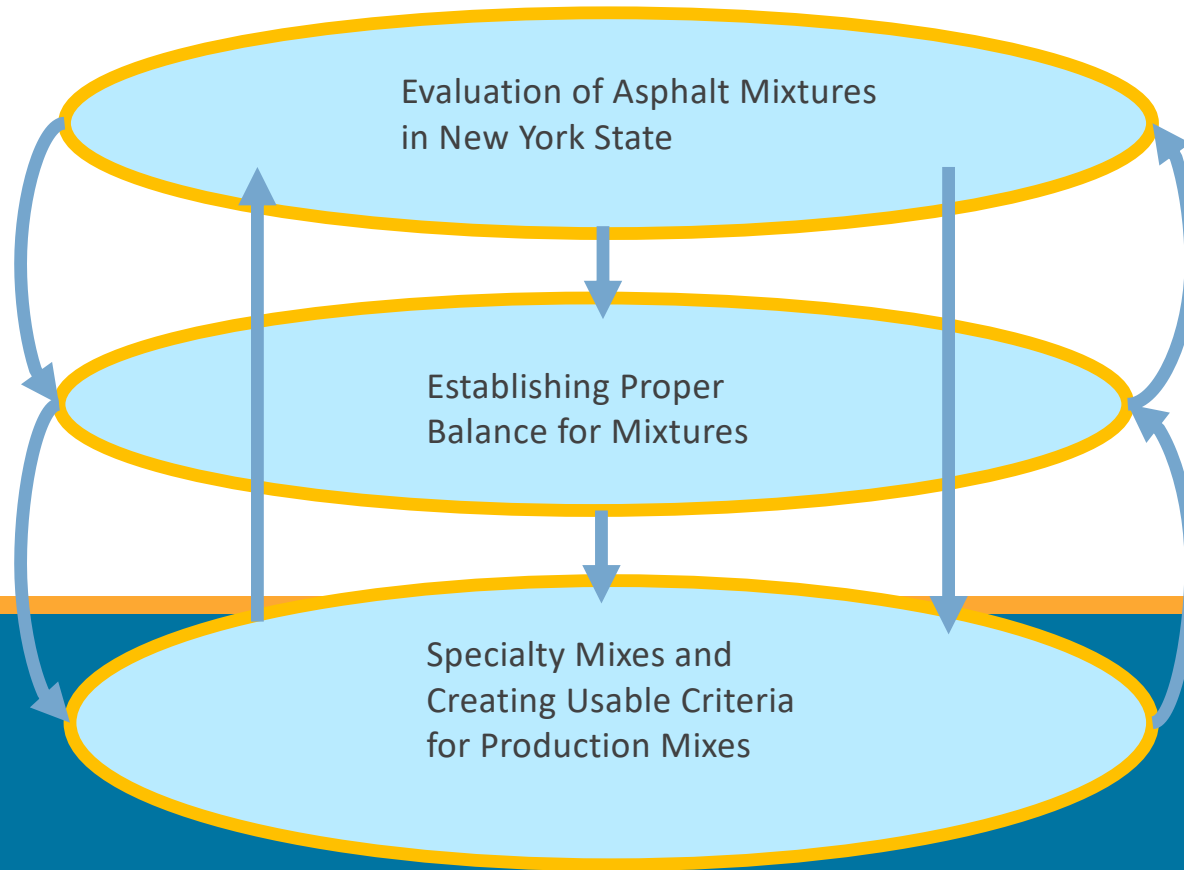
Encouraging
Innovation

Performance





Improving Mixture Performance





Department of
Transportation

2017-2019 Current Mixes



<https://www.globalgilson.com/s-emi-circular-bend-test-fixture>

Simple



<https://www.hmlabsupply.com/products/ideal-rt-jig>

IDEAL Rutting Test

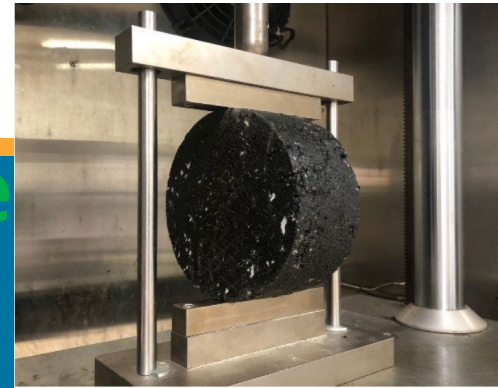
Cheap

Semi-Circular Bending Test



<https://www.globalgilson.com/in-direct-tensile-loading-fixtures>

Feasible



https://www.researchgate.net/figure/IDEAL-cracking-test-IDEAL-CT_fig1_343785079

IDEAL Cracking Test

High-Temperature IDT Test

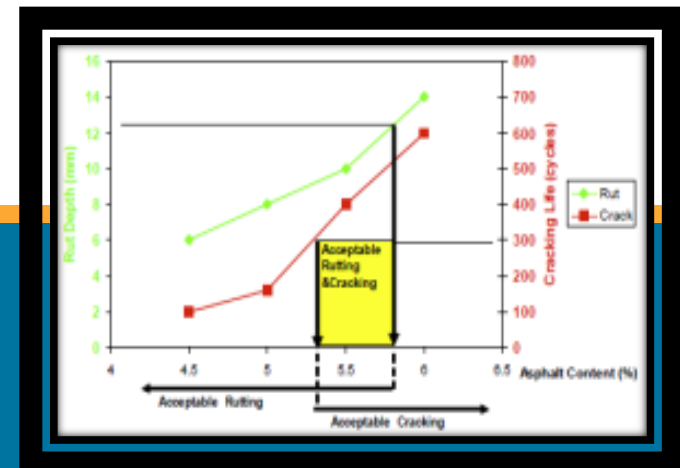


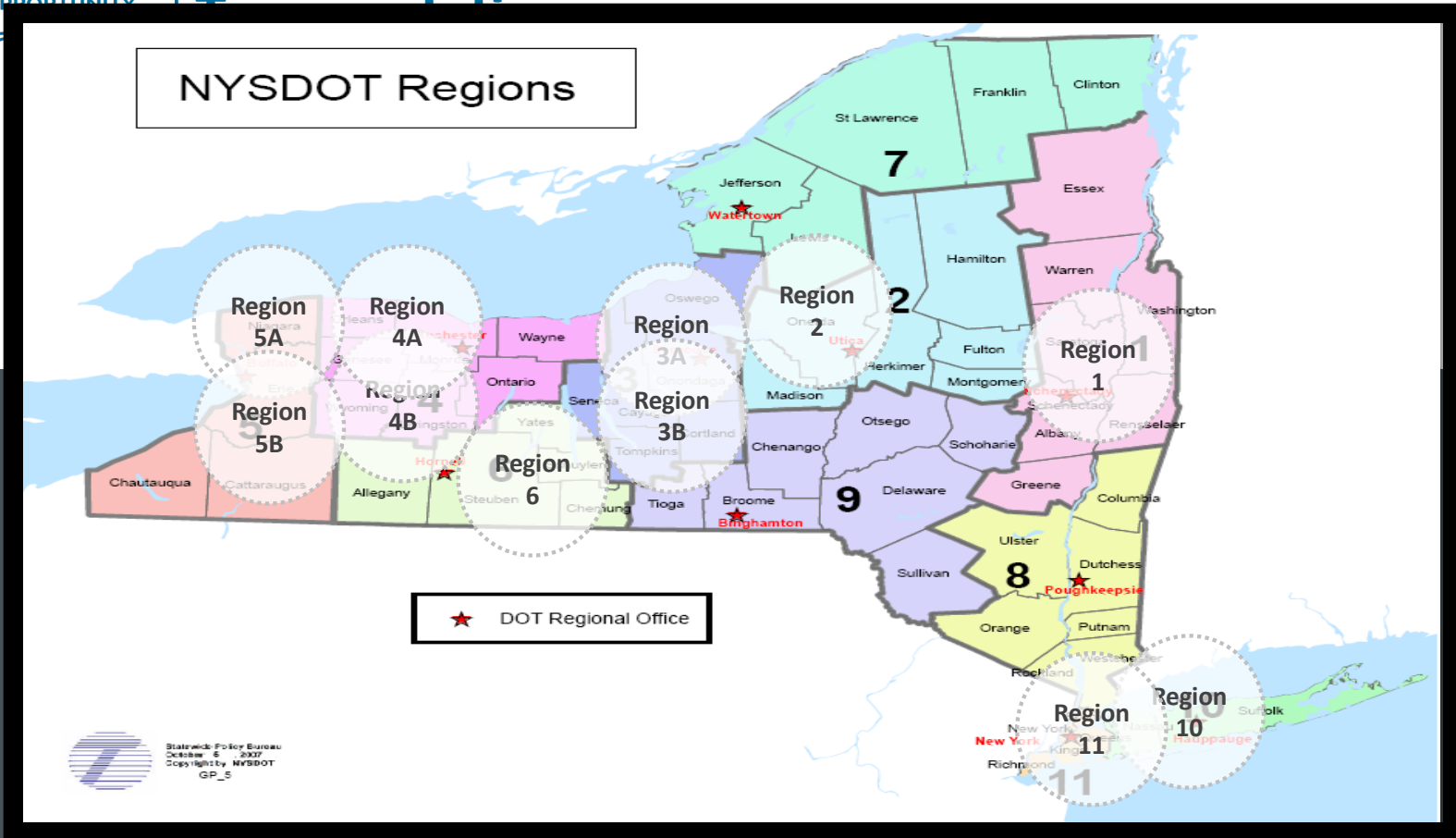
2018-2019 Rutgers Research Report

- *Investigation of Balanced Mixture Design for New York State Asphalt Mixtures*
- PI: Tom Bennert, Ph.D.
- Tests:

Rutting:
Asphalt Pavement Analyzer
Hamburg Wheel
High Temperature Indirect
Tensile

Cracking:
Overlay Tester
IDEAL Cracking Test
Semi-Circular Bending Test





Design Testing Criteria

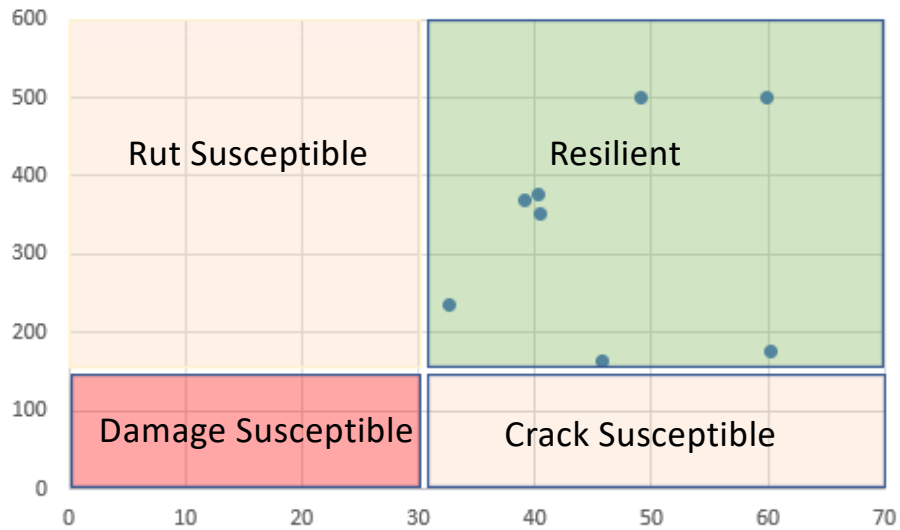
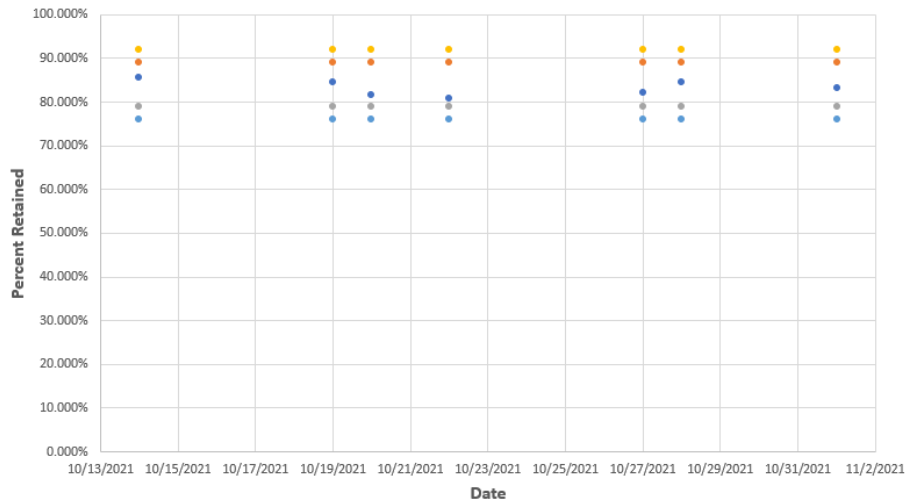


Table 1 – Performance Testing Criteria

| Test Methods | Criteria | Min. Design Value | Max. COV |
|---|-------------------|-------------------|----------|
| AASHTO T 393-21 Flexibility Index Test | Flexibility Index | 8 | ≤40 |
| ASTM D6931-17 Indirect Tensile Strength Test | IDT Strength | 30 psi | ≤40 |
| ASTM D8225-19 Determination of CT Index | CT Index | 135 | ≤40 |

Production Testing and Sampling with Control Charts



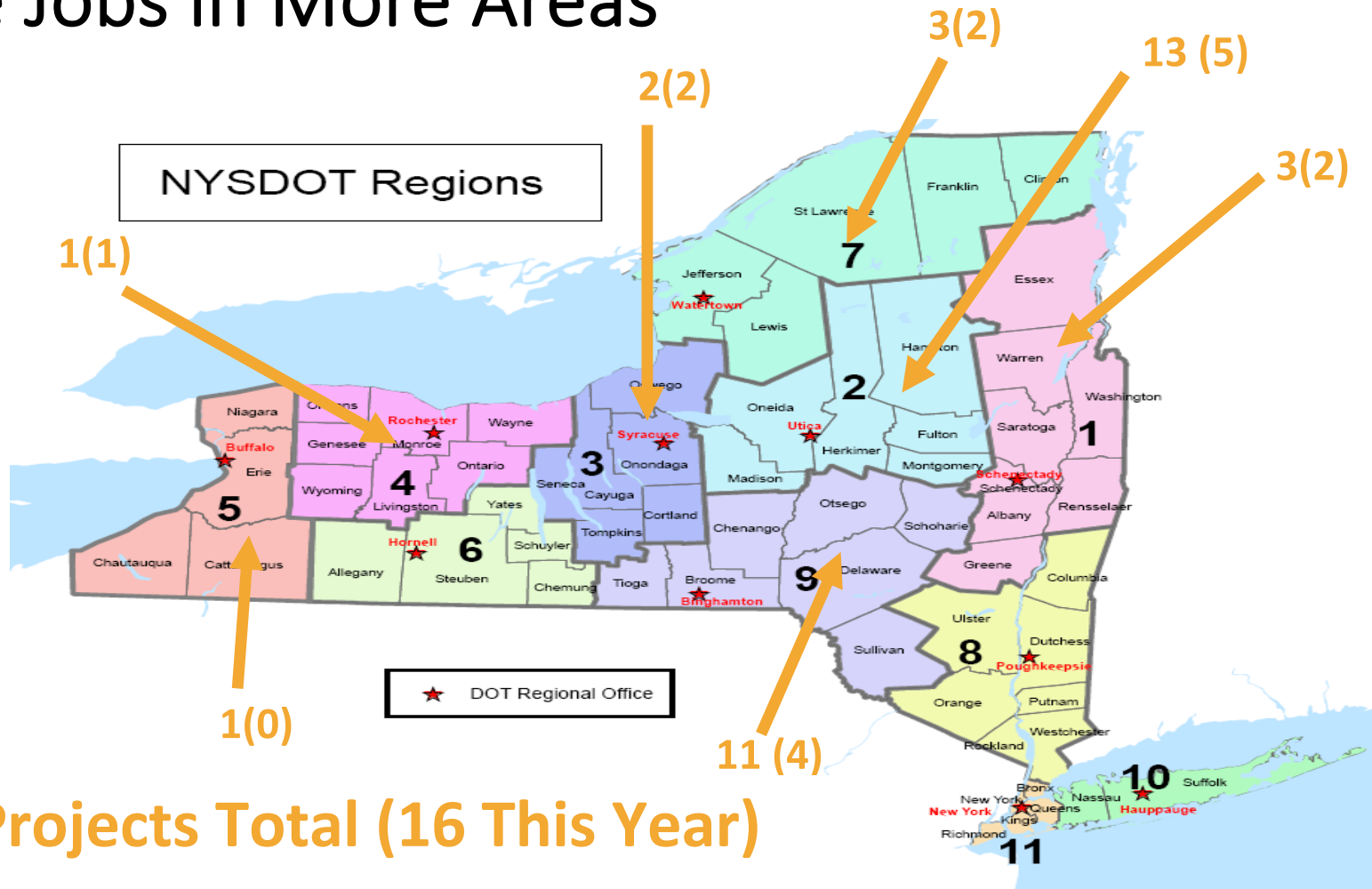
| Plant Test Property | Test Method | Producer Testing Frequency ¹ | Department Testing Frequency ² |
|---|---|---|---|
| PG Binder Content | Automation, Ignition Oven (NY 400-13C), or AASHTO T 164 Method A or B | One per subplot | One per Day (enough material for two tests) |
| Aggregate Gradation | AASHTO T27 | One per Sublot | One per Day (enough material for two tests) |
| Air Voids | MM 5.16, AASHTO T269 | One per 3 Lots | One per 3 Days |
| Indirect Tensile Strength | ASTM D6931-17 | One per 3 Lots | One per 3 Days |
| Determination of CT Index OR ³ | ASTM D8225-19 | One per 3 Lots | One per 3 Days |
| SCB Flexibility Test OR ³ | AASHTO T 393-21 | One per 3 Lots | One per 3 Days |

2023 Wish Pie



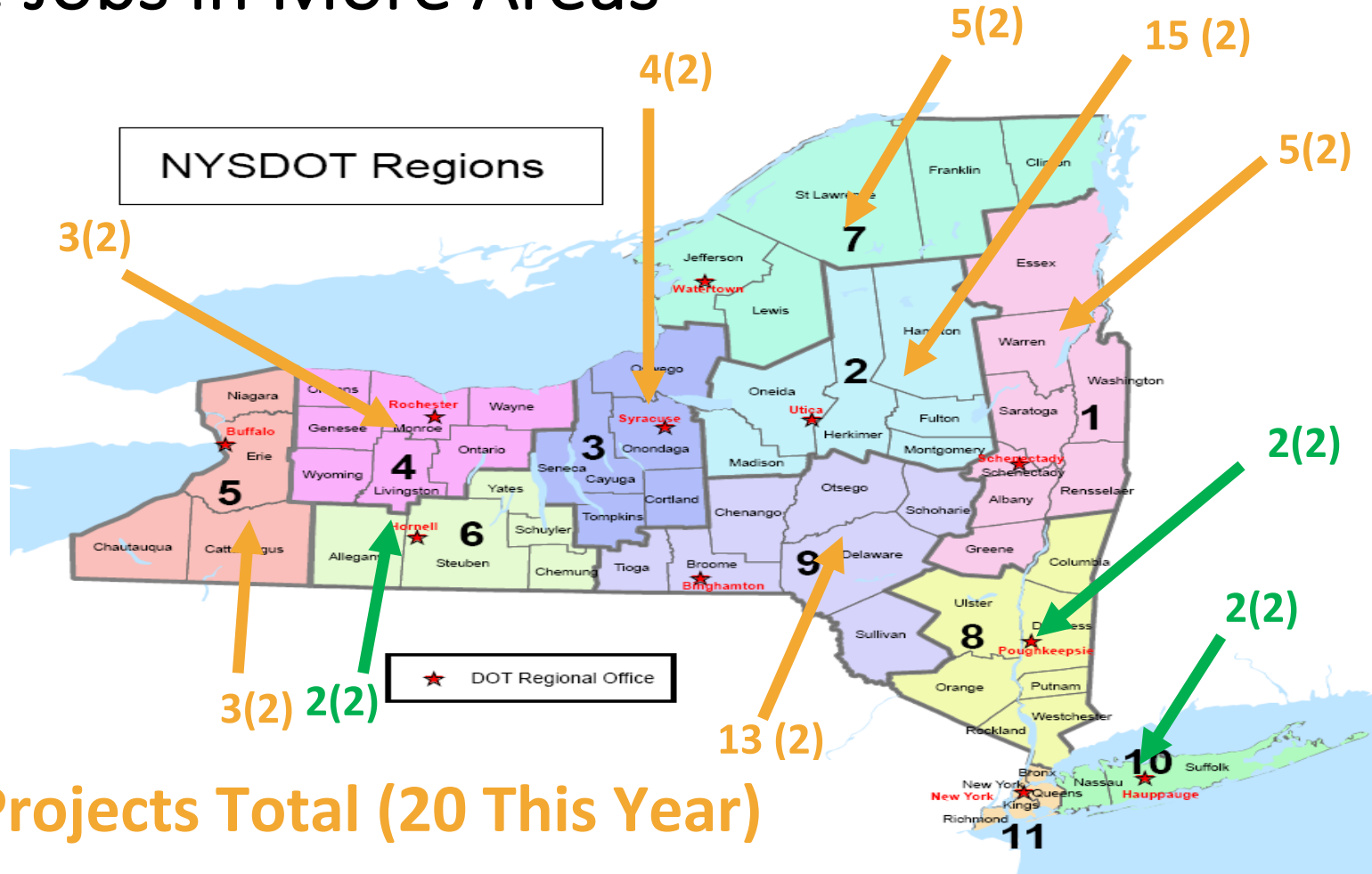
2022

More Jobs in More Areas



2023

More Jobs in More Areas



Specialty Mixture Criteria

- Waterproof Bridge Deck Overlay Mix
- High Percentage Recycled Asphalt Pavement Mixtures
- Stone Matrix Asphalt Mixture
- Porous Asphalt
- Fiber Reinforced Asphalt
- Differentiating criteria by traffic volume



Outfitting Labs



Asphalt Mixture
Performance Tester



Large Scale Mixer



Hamburg Wheel -
Smarttracker

Outfitting Labs



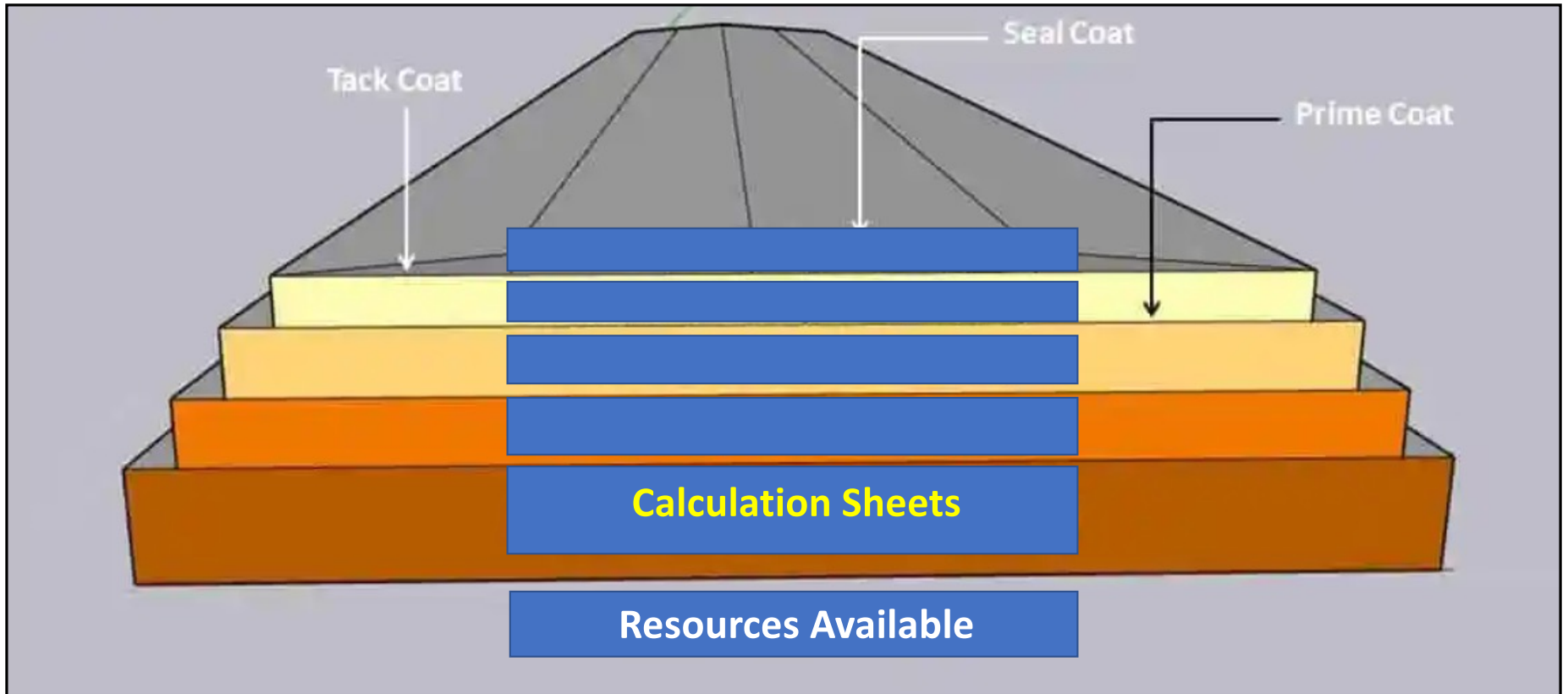
Asphalt Mixture Load Frame



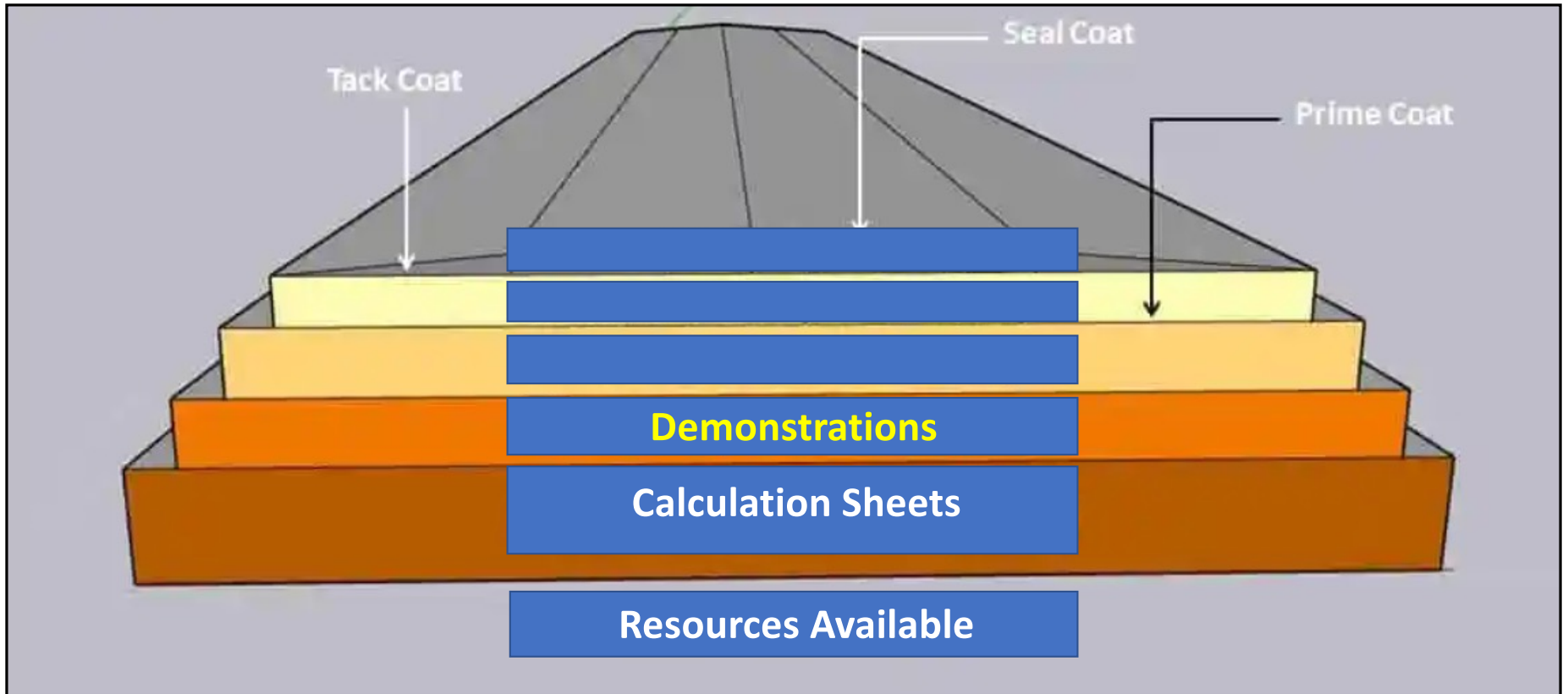
Water Bath



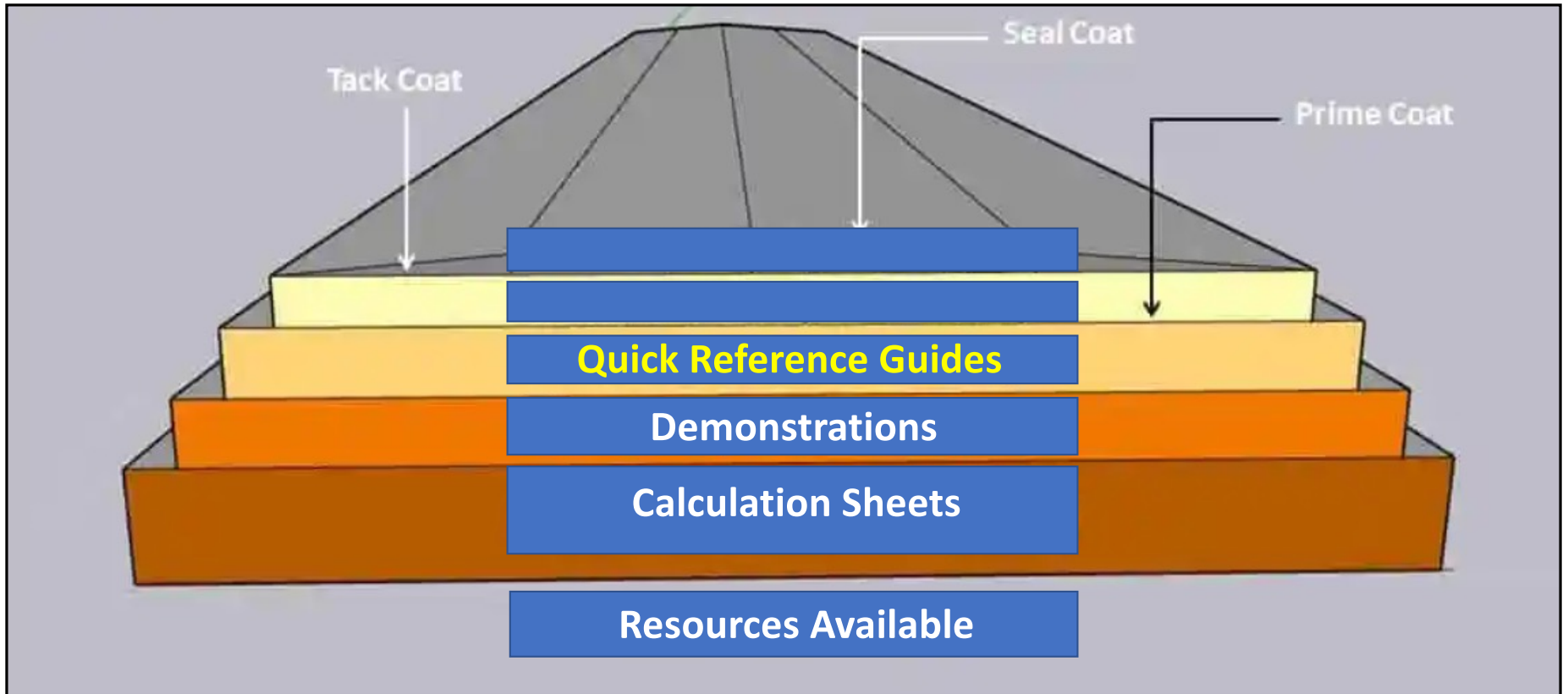
Saw



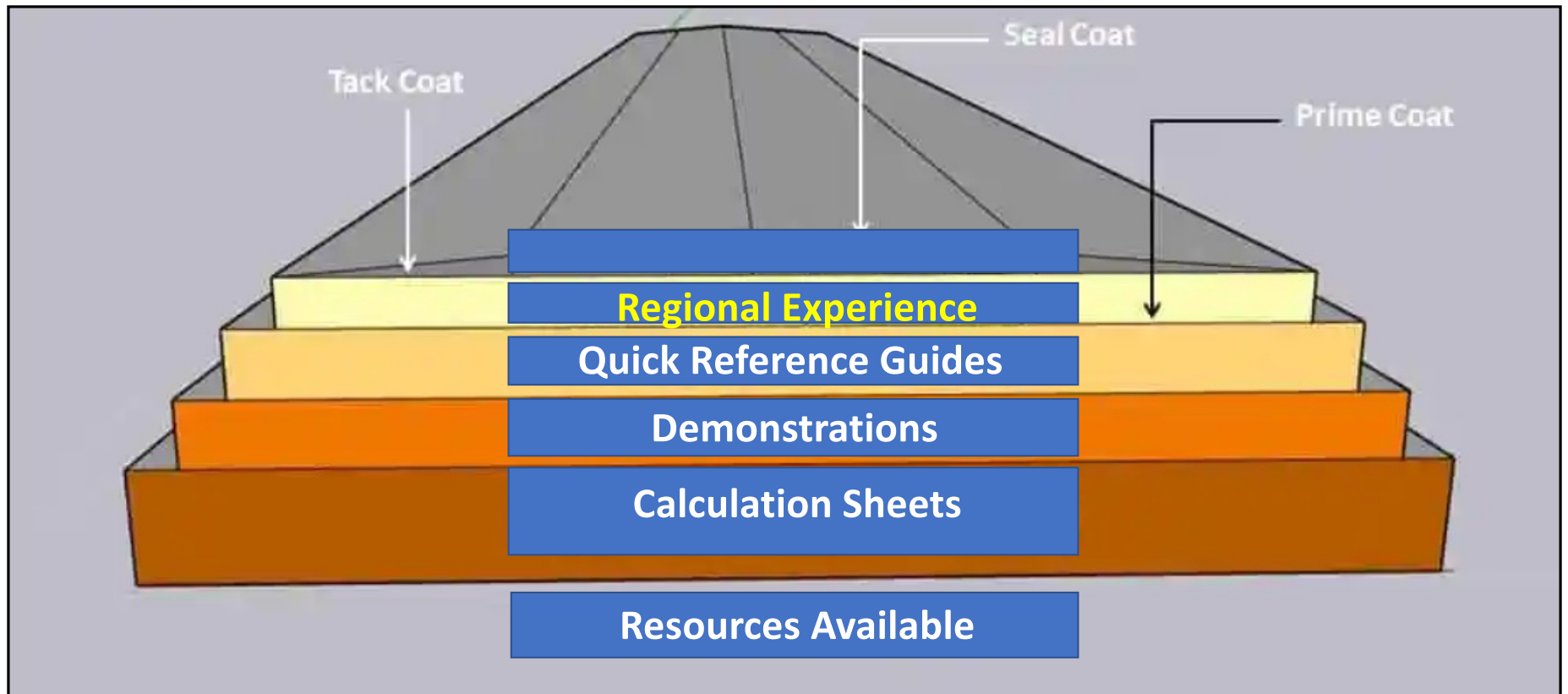
Supporting Infrastructure



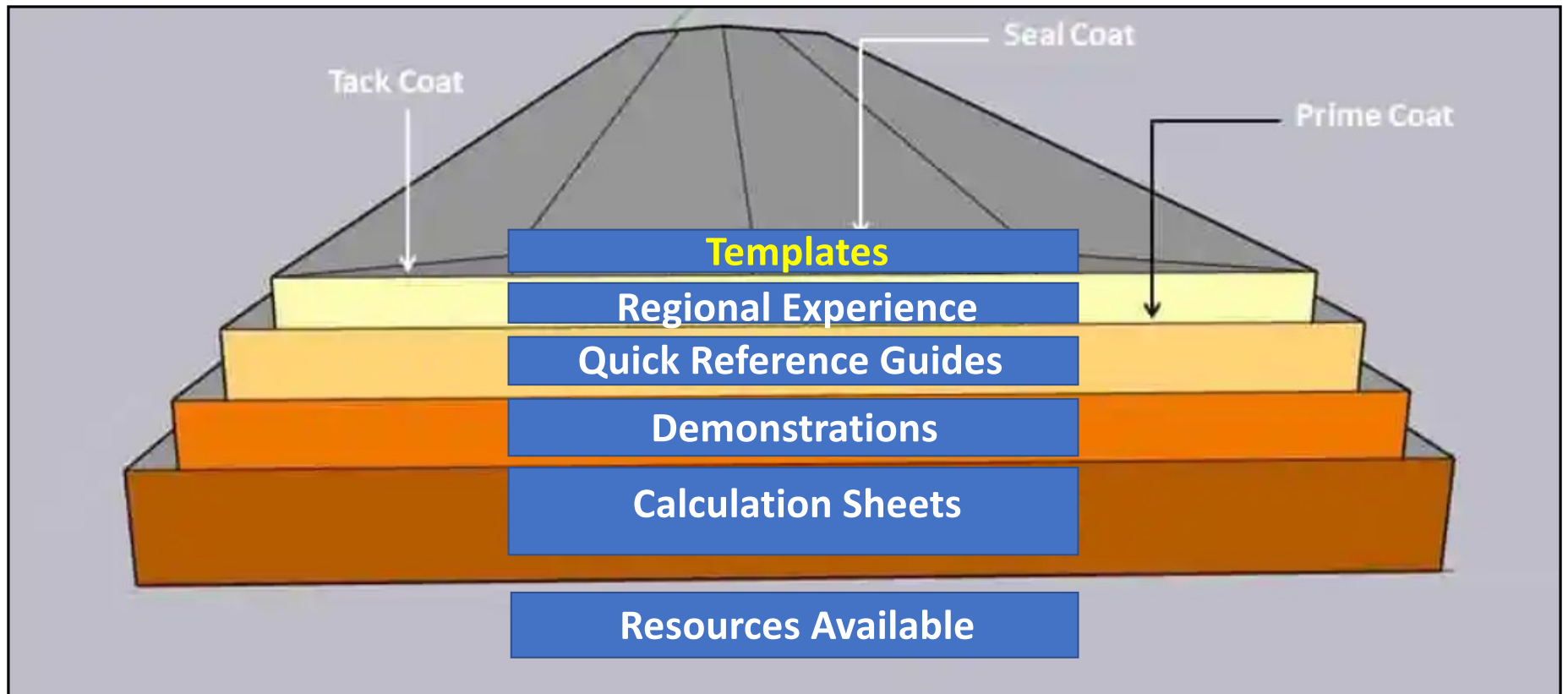
Supporting Infrastructure



Supporting Infrastructure



Supporting Infrastructure



Supporting Infrastructure

Schedule



Pre-2020

VERSION 1.0

FIRST REAL PROJECTS
EQUIP./PROCEDURE
OPERATIONAL
RUTGERS
FIRST CONTRACTOR
DATA



2021

VERSION 1.1

EXPANSION & CLARITY
MORE COMPLETE
SHOWN COMMITMENT
TO INDUSTRY



2022

VERSION 2.0

HAVE THE FULL YEAR TO
EVALUATE 2 SEASONS
SIGNIFICANT CHANGE (IF
ANY) HAPPENS NOW
EXPANSION STATEWIDE



2023

REFINEMENT BASED ON
2.0 REVISION
PREPARATION OF
DOCUMENTS TO
STANDARDIZE
DECIDE SCOPE OF USAGE



2024

REVISIONS TO ASPHALT
QC/QA PROGRAM
REVISIONS TO ASPHALT
MIXTURE APPROVAL



Implementation

